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SUMMARY REPORT ON QUALITY OF INTERSTATE WATERS

SOUTH PLATTE RIVER (COLORADO - NEBRASKA)

PUBLIC HEALTH SERVICE, WASHINGTON, D.C.

DECEMBER 1960

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(COLORADO - NEBRASKA)

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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15. Supplementary Notes

16. Abstracts

Water quality data are reported for the stream stretch of the South Platte River from Sterling, Colorado, to North Platte, Nebraska. Tabular data are provided on: sources of pollution, stream flow, interference with water uses, adequacy of treatment measures, action of official agencies, Public Health Service grants for abating pollution, and waste treatment facilities, nature of delays in abating pollution, and time schedule for proposed remedial action. A brief bibliography is included, and water quality objectives and statutory powers are appended.

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SUMMARY REPORT ON QUALITY OF INTERSTATE WATERS

(SOUTH PLATTE RIVER)

COLORADO - NEBRASKA

(Data Current to December 1, 1960)

I. LOCATION

The South Platte River rises on the eastern slope of the Rocky Mountains in central Colorado and flows southeasterly about 50 miles through a sparsely populated high-mountain valley and then northeasterly through the eastern foothills, emerging on the great plains just southwest of Denver, Colorado (river mile 300). It then continues north and northeasterly to the northeast corner of the State of Colorado, crossing the boundary into Nebraska near Julesburg, Colorado (river mile 87). It continues northeasterly and easterly into Nebraska to its junction with the North Platte River at North Platte, Nebraska. The total length of the river is 440 miles.

This summary report deals with the stream stretch from Sterling, Colorado, (river mile 153), to North Platte, Nebraska. Lodgepole Creek (river mile 90) is the sole major tributary to this reach of the stream. It rises in extreme southeastern Wyoming and flows southeasterly across the extreme southwestern portion of the Nebraska panhandle, before turning south into Colorado to join the South Platte River at Ovid, Colorado (river mile 90). Sutherland Reservoir, located just south of Sutherland, Nebraska (river mile 24) is a relatively large impoundment of a part of the flow of the South Platte River.

II. SOURCES OF POLLUTION

Major sources of interstate pollution are the municipality of Ovid, Colorado, and the Great Western Sugar Company Refinery at Ovid, Colorado.

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 1/

Municipality or Industry	River Miles Above Mouth	Sewered Population	P.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to watercourse
South Platte River						
Sterling, Colo.	153	7,500	7,500	Munic.	Primary	5,600
Great Western Sugar Co.	153	-	120,000 2/	Sugar Refining	None	108,000
Sterling Packing Co.	153	-	880	Packing Plant	Lagoon	0
Sterling Rendering Plant	153	-	1,250	Rendering Plant	None	1,250
Crook, Colo.	113	225	225	Domestic	Imhoff Tank	150E*
Lodgepole Creek	90					
Pine Bluffs, Wyo.	90-121	800	800	Munic.	Lagoon	0
Wyo.-Nebr. State Line	90-120					
Bushnell, Nebr.	90-Undet.	300	300	Munic.	Lagoon	0
Kimball, Nebr.	90-96	2,000	2,000	Munic.	Lagoon	0
Potter, Nebr.	90-Undet.	400	400	Munic.	Lagoon	0
Sidney, Nebr.	90-56	8,000	8,000	Munici.	Secondary	1,600E*
Sioux Ordnance Depot	90-56	-	Inorganic	Vehicle Cleaning	Subsurface	Inorganic
Sioux Ordnance Depot	90-56	630	630	Domestic	Secondary	0
Star Packing Co.	90-55	-	330	Packing Plant	None	330
Union Pacific RR	90-55	-	Undet.	Undet.	None	Undet.

TABLE NO. 1 - BASIC DATA ON SOURCES OF POLLUTION 1/

Municipality or Industry (Cont'd)	River Miles Above Mouth	Sewered Population	B.E. Waste Before Treatment	Nature of Wastes	Treatment Provided	P.E. Discharge to watercourse
Lodgepole, Nebr.	90-Undet.	555	555	Munic.	Lagoon	0
Chappell, Nebr.	90-12	1,200	1,200	Munic.	Primary	500
Nebr.-Colo. State Line	90-5					
Ovid, Colo.	90-0.2	850	850	Munic.	None	850
Great Western Sugar Co.	90-0.2	-	290,000	Sugar Refining	In Plant Reduction	90,000
South Platte River						
Julesburg, Colo.	87	1,800	1,800	Munic.	Secondary	400E*
Platte Valley Potato Growers	--	-	Inorganic	Potato Washing	Lagoon	Inorganic
H.E. Reichelt, Jr.	-	-	Inorganic	Potato Washing	None	Inorganic
Union Pacific RR Water Plant	-	-	Inorganic	Water Softening	Lagoon	Inorganic
Colo.-Nebr. State Line	85					
Ogalla, Nebr.	56	2,000	2,000	Munic.	Secondary	400E*
Union Pacific RR	55	-	Undet.	Undet.	None	Undet.
Paxton, Nebr.	36	450	450	Munic.	Secondary	100
Sutherland, Nebr.	19	900	Undet.	Munic.	Lagoon	0
North Platte, Nebr.	5	6,900	6,900	Munic.	None	6,900

To date discharges to the South Platte River from the sources of pollution in Colorado and Nebraska have continued as indicated above.

1/ From PHS 1957 Inventory of Waste Treatment Facilities or PHS regional files.

2/ In plant reduction.

*E- Estimated.

TABLE NO. 2 - STREAM FLOW DATA IN cfs 3/

No. and Location of Gaging Station	Years of Record	Average	Maximum	Minimum
South Platte River at Balzac, Colo.	41	352	31,200	1.3
Lodgepole Creek at Ralton, Nebr.	6	10.5	1,150	0
South Platte River at Julesburg, Colo.	55	455	31,300	0
South Platte River at Paxton, Nebr.	20	-	16,900	0.1

III. INTERFERENCE WITH WATER USE

Wastes discharged into the South Platte River from sources in Colorado pollute the stream as it flows into Nebraska. However at the present time, such pollution is not known to interfere with water uses in the downstream State.

The interstate portions of Lodgepole Creek described previously are considered to be of satisfactory quality at the present time.

IV. ADEQUACY OF TREATMENT MEASURES

The following listing shows adequacy of treatment for all sources of pollution shown in Table No. 1 which have treatment facilities:

Municipality or Industry	Treatment Needs
Sterling, Colo.	Plans & specifications approved - Construction should begin early in 1961
Sterling Packing Co.	None
Pine Bluffs, Wyo.	None
Bushnell, Nebr.	None
Kimball, Nebr.	None

3/ From USGS Water Supply Paper No. 1510.

Municipality or Industry (cont'd)	Treatment Needs
Potter, Nebr.	None
Sidney, Nebr.	None
Sioux Ordnance Depot	None
Lodgepole, Nebr.	None
Chappell, Nebr.	None
Great Western Sugar Co. (Ovid, Colo.)	New Plant
Julesburg, Colo.	None
Platte Valley Potato Growers	None
Union Pacific RR	None
Ogallala, Nebr.	None
Paxton, Nebr.	None
Sutherland, Nebr.	None

V. ACTION OF OFFICIAL AGENCIES

a. Federal and Federal-State Joint Action

This interstate pollution problem was noted initially by the Public Health Service in July 1950 in its report, South Platte River Basin Water Pollution Investigation, and was later evaluated in its report, Evaluation of Interstate Pollution, South Platte Basin, Colorado, Wyoming, and Nebraska, dated November 4, 1952. The latter report outlined the sources and nature of pollution, their effect on water uses, the status of abatement activities, additional action needed, and recommended degree of treatment. It further outlined the division of responsibility for abatement of the pollution.

The cooperative State-Federal report, A Report of Water Pollution in the South Platte River Basin, was published by the Public Health Service in February 1953 as PHS Publication No. 235, Water Pollution Series No. 39. A Comprehensive Program for Control of Water Pollution - Missouri Drainage Basin was published in 1953 (Public Health Service Publication No. 317, Water Pollution Series No. 56.)

TABLE NO. 3 - PUBLIC HEALTH SERVICE GRANTS FOR CONSTRUCTION OF WASTE TREATMENT FACILITIES 4/

Municipality	Date Approved	Amount	Estimated Total Cost of Project	Type of Project	Status of Project
Julesburg, Colo.	8/57	$ 37,948	$126,493	New Secondary treatment plant	Complete
Sterling, Colo.	7/60	138,831	462,770	New Secondary treatment plant	Plans and specifications approved - Construction should begin early in 1961
Ogalla, Nebr.	9/57	76,748	255,825	New secondary treatment plant & intercepting sewer	Complete
Sutherland, Nebr.	12/57	6,976	23,255	New primary treatment plant	Complete
Kimball, Nebr.	12/57	21,340	74,693	Lagoon	Complete

b. State Action

The pollution control officials of the several States in the Missouri Basin, including Colorado and Nebraska, have agreed on uniform high standards for water pollution abatement. On January 7, 1954, the Engineering Section, Missouri Basin Health Council,

4/ From PHS Region Files.

adopted the "Guide for Water Pollution Control Program, Missouri Drainage Basin", which includes water quality objectives for the various legitimate water uses, such as domestic, irrigation, and fish and wildlife, and indicates the desired treatment for municipal and industrial wastes to protect these water uses and water quality. These water quality objectives are set forth in Appendix "A".

The Colorado State Department of Public Health has statutory powers to abate the pollution of the streams of the State. A synopsis of these powers is contained in Appendix "B".

The Colorado Board of Health, in 1957, adopted "Sewage and Trade Wastes Effluent Regulations". On May 18, 1959, the Governor of Colorado signed into law a bill setting statutory requirements for quality of effluents where human excreta is a component. (See Appendix "B").

Following adoption of the 1957 Regulations, the Colorado State Department of Public Health advised municipalities and industries of the Regulations and their requirements. The City of Ovid, Colorado, was notified by the Department that it must provide its municipal sewage with secondary treatment or its equivalent; while the Department recommended to the Great Western Sugar Company that it reduce the amount of pollution being discharged from its refinery at Ovid. To date, the City has not taken satisfactory action to comply with the Department's requirement; while the Great Western Sugar Company has reduced the population equivalent of its wastes to 90,000.

The Department, in 1957, recommended to the City of Julesburg, Colorado, that it provide secondary sewage treatment plus chlorination.

The City completed (with the assistance of a Public Health Service grant) a plant to provide the necessary treatment in 1959. At the present time the Department feels that pollution caused by the H. E. Reichelt Company in Julesburg is not significant.

Recently the Colorado State Department of Public Health published a booklet entitled, "We Can Clean Up the South Platte River". Some 10,000 copies of this booklet have been distributed in an effort to stimulate stronger public sentiment towards the immense water pollution problems in the South Platte Valley.

The Nebraska Water Pollution Control Council, acting under its new State Law (Laws of Nebraska 1957, Chapter 300, Sections 1-18) has formally adopted the guide to water pollution control programs, as carried on Page 9 of Water Pollution Series No. 56, as the official program of the State of Nebraska. The program in Nebraska is proceeding along these lines.

VI. NATURE OF DELAYS IN ABATING POLLUTION

Because of the existence of intrasate pollution in Nebraska, the Nebraska Department Department of Health has not requested Colorado to abate the interstate pollution of the South Platte River. However, progress in Nebraska has reached the point where the State may reasonably solicit treatment of wastes discharged to the South Platte River in Colorado.

In Colorado, the municipality of Ovid and the Great Western Sugar Company Refineries at Ovid and Sterling have yet to provide necessary waste treatment facilities.

VII. TIME SCHEDULE OF PROPOSED REMEDIAL ACTION

Item 8 of the Colorado Sewage and Trade Wastes Effluent Regulations, adopted in January 1957, gives January 1958 as the data for compliance.

BIBLIOGRAPHY

(1) Department of Health, Education, and Welfare, Public Health Service, 1957 Inventory of Municipal and Industrial Waste Facilities, Volume 6 & 8, Washington, D. C., 1958

(2) Federal Security Agency, Public Health Service, South Platte River Basin Water Pollution Investigation, Washington, D.C., 1950

(3) Federal Security Agency, Public Health Service, South Platte River Drainage Basin, Washington, D.C., 1953, PHS Publication No. 235

(4) Department of Health, Education, and Welfare, Public Health Service, A Comprehensive Program for Control of Water Pollution - Missouri Drainage Basin, Washington, D.C., July 1953, PHS Publication No. 317

(5) Colorado Board of Health, Sewage and Trade Waste Effluent Regulations, January 14, 1957

(6) United States Geological Survey, Surface Water Supply of the United States, 1957, Part 6-B Missouri River Basin below Sioux City, Iowa, Washington, D.C., 1959, Geological Survey Water-Supply Paper 1510

APPENDIX "A"

WATER QUALITY OBJECTIVES ESTABLISHED BY ENGINEERING SECTION, MISSOURI BASIN HEALTH COUNCIL IN "GUIDE FOR WATER POLLUTION CONTROL PROGRAM, MISSOURI DRAINAGE BASIN"... (ADOPTED JANUARY 7, 1954)

"Subject to (a) such higher objectives as may be desired by any State and (b) such other modification as may be deemed necessary, after appropriate investigation, by the State Water Pollution Control Agency concerned, the Engineering Section, Missouri Basin Health Council recommends the following for consideration by the member States as a tentative guide for water pollution control activities in the Missouri Drainage Basin:

1. Toxic substances including metallic ions, phenolic compounds, oils, alkalies, and acids should be virtually eliminated from sewage effluents.
2. Removal of settleable and floating solids to prevent sludge banks, floating materials, and nuisance conditions should be required as the minimum acceptable treatment.
3. For industrial wastes similar in nature to municipal wastes, treatment should be based on the same premise as recommended for municipalities. For industrial wastes not comparable to municipal wastes, treatment should be provided as necessary to prevent deterioration of water quality for beneficial uses in the receiving stream.
4. Additional treatment over that specified in item 2 above should be provided as necessary to protect downstream water uses. Quality objectives for certain water uses are:
   (a) For water serving as a source of domestic supply, raw water bacteriological quality

should conform to that recommended in 'Manual of Recommended Water Sanitation Practices, 1946, Public Health Bulletin #296', pages 11-13.

(b) For bathing or swimming waters, monthly arithmetical average 'most probable number' of coliform organisms should not exceed 1,000 per 100 ml during any month of the recreation season; nor exceed this number in more than 20 percent of the samples examined during any such month; nor exceed 2,400 per 100 ml on any day. For non-bathing or non-swimming waters, the monthly arithmetical average 'most probable number' of coliform organisms should not exceed 5,000 per 100 ml in any month of the recreational season, nor should exceed this number in more than 20 percent of the samples examined during any such month.

(c) For fish and aquatic life a minimum oxygen concentration of 5.0 ppm is desirable in waters otherwise offering suitable fishery habitat, with 6.0 ppm for trout streams.

(d) For bacteriological quality of irrigation water:

(1) Sewage used for irrigation of forage crops should be given treatment insuring a consistant reduction in coliform bacteria of not less than 90 percent.

(2) Sewage used for irrigation of human food crops should be given treatment insuring a

consistent reduction (a) in suspended solids of not less than 75%, (b) in 5 day 20° C. B.O.D. of not less than 75% and (c) in coliform bacteria of not less than 98 percent, unless discharged into a stream where the volume of dilution water, available during the low flow periods during which irrigation diversions may occur, is at least 10 times greater than the anticipated maximum daily volume of sewage, in which case a bacterial reduction of 90 percent may be acceptable. Provided, however, that where the time of passage from plant discharge to irrigation diversion is such as to permit the normal death rate of bacteria as evidenced by the die-away curve to provide equivalent bacterial reduction, the requirements of (1) and (2) above may be appropriately modified."

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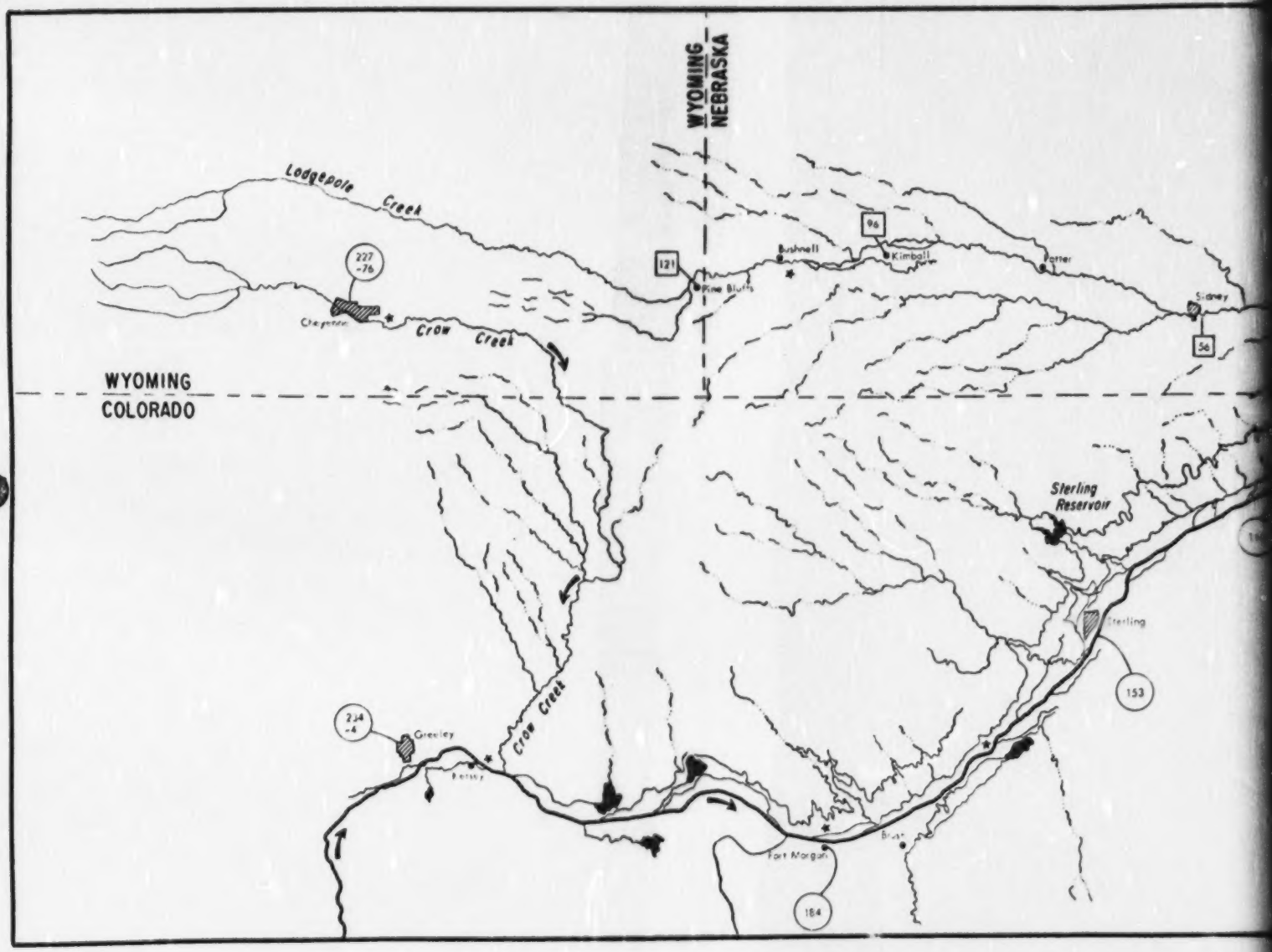
APPENDIX "B"

Synopsis of Statutory Powers of Colorado State Department of Health to Abate Pollution of Streams of the State.

The Colorado State Department of Public Health is authorized by statute to establish and enforce minimum general sanitary standards as to the quality of effluent of sewerage systems and trade wastes discharged upon the land or into the surface or ground waters. (Colorado Revised Statutes Annotated, 1953, Chapter 66-1-7.) In addition, a 1955 amendment to this law establishes bacterial standards for waste discharges containing human excreta. (Colorado Revised Statutes Annotated, 1953, 1955 Cumulative Supplement, Chapter 66-1-7 (19)). A 1959 amendment established standards for BOD, suspended solids, and settleable solids where human excreta is a component of the wastes.

The Colorado State Department of Public Health has authority to make water pollution investigations. Suspected violations of law and regulations may be presented at hearings of the State Board of Health (the policy-making arm of the Department of Public Health) and the Board, thereafter, shall render a decision as to abatement measures and procedures required and issue orders for abatement by the violator.


WYOMING
NEBRASKA
Lodgepole Creek
227
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Crow Creek
121
Pine Bluffs
Bushnell
96
Kimball
Potter
Sidney
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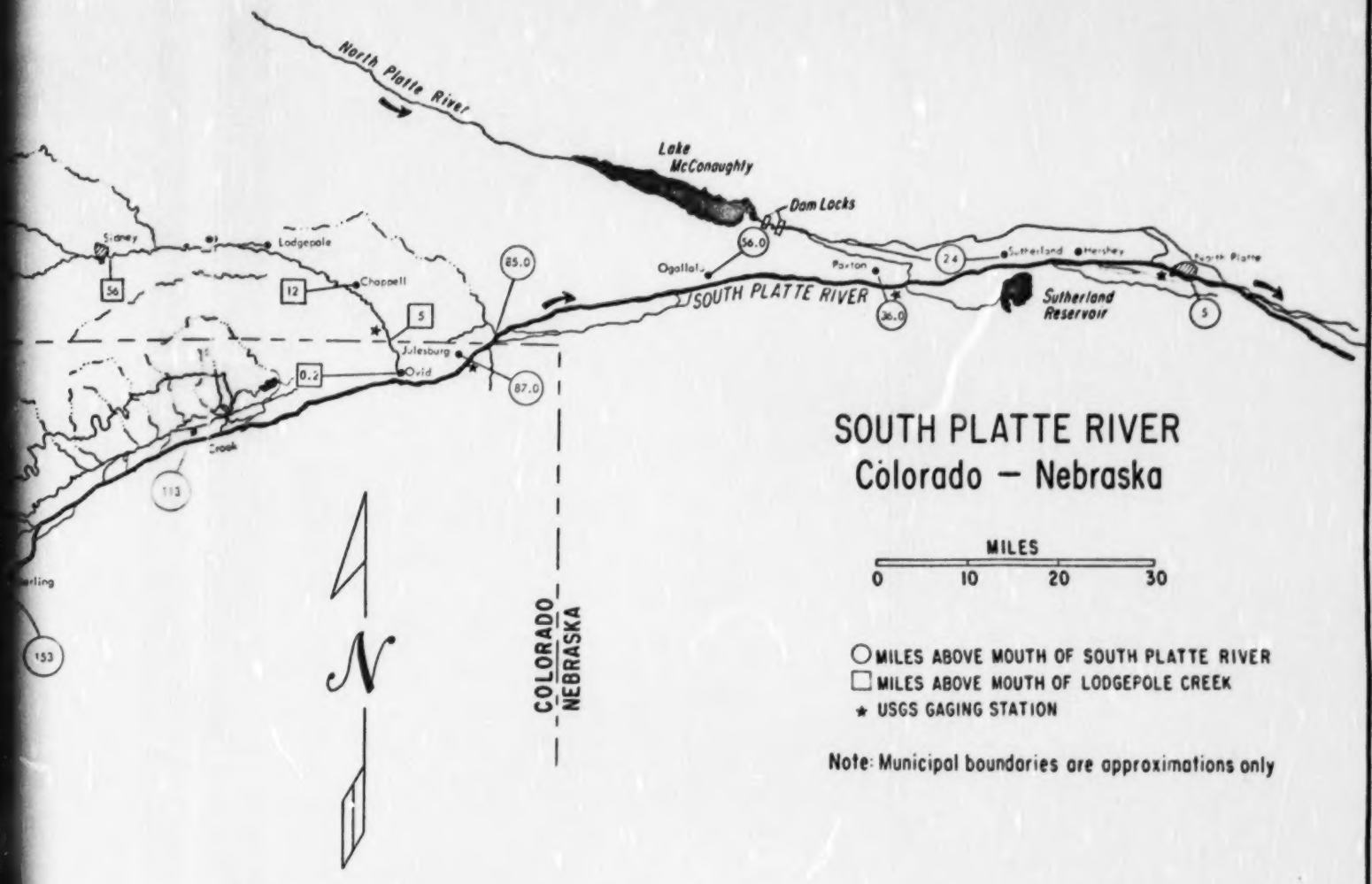
WYOMING
COLORADO
Sterling Reservoir
Sterling
153
234
-4
Greeley
Crow Creek
Fort Morgan
184



SOUTH PLATTE RIVER
Colorado — Nebraska

MILES
0 10 20 30

○ MILES ABOVE MOUTH OF SOUTH PLATTE RIVER
□ MILES ABOVE MOUTH OF LODGEPOLE CREEK
★ USGS GAGING STATION

Note: Municipal boundaries are approximations only